

REMARKS/ARGUMENTS

Upon entry of this Amendment, which amends Claims 1, 3, 4, 6, 7, 10, 13-17 and 20, and adds new Claims 21-26, Claims 1-26 remain pending in the present application.

In the November 17, 2004 Office Action, the drawings were objected to. The specification was objected to for various informalities. Claims 6 and 15 were objected to for various informalities. Claims 3, 5, 6 and 19 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Claims 1-12, 16, 17, 19 and 20 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,805,640 to O'Dea et al. (hereinafter referred to as O'Dea et al.) Claim 18 was rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,705,959 to O'Loughlin (hereinafter referred to as O'Loughlin). Claim 15 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over O'Dea et al. in view of O'Loughlin. Finally, Claims 13, 14, 16 and 17 were objected to for depending on rejected base claims, but were indicated as being allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Applicant respectfully requests reconsideration of the claims in view of the above amendments and the comments below.

Objections to the Drawings

In the November 17, 2004 Office Action, the originally submitted informal drawings were objected to for various informalities. Applicant previously submitted formal drawings that address these objections. The formal drawings were submitted to in

a communication to the PTO dated January 23, 2004. Applicant requests, therefore, that the objections to the drawings be withdrawn.

Objections to the Specification

In the Office Action, the specification was objected to for not containing an Abstract. An Abstract was previously submitted to the PTO in a communication dated January 23, 2004. Applicant requests, therefore, that the objection to the specification for not including an Abstract be withdrawn.

The specification was also objected to for various informalities (e.g., typographical errors). In response, Applicant has amended the specification to correct the typographical errors.

Objection to the Claims – Claims 6 and 15

In the Office Action, Claims 6 and 15 were objected to for various informalities. Claims 6 and 15 have been amended in a manner that renders these objections inapplicable. Accordingly, Applicant requests that the objections be withdrawn.

35 U.S.C. § 112, Second Paragraph, Claim Rejections -- Claims 3, 5, 6 and 19

In the Office Action, Claims 3, 5, 6 and 19 were rejected for allegedly being indefinite for not providing antecedent basis for various phrases and terms.

With respect to the rejection of Claim 3, the phrase “said approximate time instant” no longer appears in Claim 3.

With respect to Claim 5, Applicant respectfully disagrees that the term “said function” lacks antecedent basis. Claim 5 depends from Claim 4, which recites “a mathematical function”. Accordingly, proper antecedent basis for the term “said function” is found in Claim 4.

With respect to Claim 6, the phrase “the small number of points” no longer appears in Claim 6.

With respect to Claim 19, Applicant respectfully disagrees that the term “the intersecting line” lacks antecedent basis. Claim 19 depends from Claim 6, which depends from Claim 5. Claim 5 recites “an intersecting line”. Accordingly, proper antecedent basis for the term “the intersecting line” in Claim 19 is found in Claim 5.

In light of the foregoing, Applicant respectfully requests that the indefiniteness rejections of Claims 3, 5, 6 and 19 be withdrawn.

35 U.S.C. § 102(b) Claim Rejections -- Claims 1-12, 16, 17, 19 and 20

In the Office Action, Claims 1-12, 16, 17, 19 and 20 were rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by O’Dea et al. For the following reasons, Applicant respectfully disagrees.

O’Dea et al. is described in detail in the background section of the present patent application. (See pages 3-7 of the specification.) The drawbacks and deficiencies of the O’Dea et al. approach (a.k.a. the “T/2 method”) are also explained in the specification. Specifically, on pages 4-5 of the specification, it is explained that:

“The method used in the T/2 approach...is very restrictive in that:

1) The signal envelope is only tested for a minimum value at half-symbol timing ($t = i \cdot T + T/2$).

2) The phase of the correction is not based on the signal envelope, but rather only on the two symbols adjoining the low-magnitude event.

These two restrictions can lead to errors in the magnitude and phase of the corrective pulses. Specifically, the true signal minimum may occur not at $T/2$, but at some slightly different time, so that error will be introduced into the magnitude of the corrective pulses....The size of this magnitude error can be quite large. For example, in some cases the magnitude $T/2$ is very near the desired minimum magnitude, but the true minimum is very close to zero. In such cases the calculated correction magnitude is much smaller than would be desired, which in turn results in the low-magnitude event not being removed.

The signal envelope at $T/2$ may be greater than the desired minimum, but the signal magnitude may be below the threshold during this inter-symbol time interval, so that a low-magnitude event may be missed entirely.

In any event, the correction magnitude obtained is far from what is needed.

The method used to calculate the corrective phase essentially assumes that the phase of the pulse shaped waveform at $T/2$ will be very close to the phase of straight line drawn between the adjoining symbols. This is an approximation in any case...which will introduce some error in the phase. However this approximation is only valid if the origin does not lie between the previously described straight line and the true signal envelope. When this assumption is violated, the corrective phase will be shifted by approximately 180 degrees from the appropriate value. This typically leaves a low-magnitude event that is not corrected.”

Independent Claim 1 is not limited to placing corrective pulses at half-symbol timing (i.e., at $t = k \cdot T + T/2$). Indeed, Claim 1 allows for placement of correction pulses at arbitrary timing. One reason for this improvement is that, unlike O’Dea et al., which uses symbols, the claimed invention uses “signal sample points”. It is important to understand that signal sample points are not the same as, or equivalent to, constellation symbols, and that there are typically many signal sample points per symbol. As described in detail in the specification of the present application, because the O’Dea et al. system uses only symbol intervals (i.e., does not generate and use signal sample points), the O’Dea et al. is apt to generate errors. (See pages 4-6 of the specification as filed.)

Use of signal sample points and the operations using signal sample points is reflected in independent Claim 1. For example, after “mapping a digital stream of bits onto a symbol constellation to generate a sequence of symbols,” “generating signal sample points from the sequence of symbols” is performed. This operation of “generating signal sample points” is not taught or even suggested by O’Dea et al.

Because O’Dea et al. does not generate signal sample points, it cannot perform the remaining operations of Claim 1. Specifically, O’Dea et al. does not teach “identifying...two signal sample points...,” or “using a mathematical model of the communications signal [for] determining a minimum of the communications signal envelope between the signal sample points and a time at which the minimum between the signal sample points occurs”.

For at least the foregoing reasons, Applicant respectfully believes that the § 102(b) rejection of independent Claim 1 cannot be properly maintained. Applicant requests, therefore, that the rejection be withdrawn.

All of the other claims rejected for allegedly being anticipated by O’Dea et al. (i.e., Claims 2-12, 16, 17, 19 and 20) depend from independent Claim 1. Accordingly, they derive patentability for depending on what appears to be an allowable base claim. Applicant requests, therefore, that the § 102(b) rejections of these dependent claims also be withdrawn.

35 U.S.C. § 102(b) Claim Rejection – Claim 18

In the Office Action, Claim 18 was rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by O’Loughlin. For the following reasons, Applicant respectfully disagrees.

O’Loughlin discloses a system and method that provides a means for high efficiency low distortion amplification of complex modulated radio frequency signals. The innovative principle of the invention is based on the simultaneous amplitude and phase or angle modulation of Class “C” amplifier.

By contrast, independent Claim 18 claims a method of altering a communications signal to reduce an average-to-minimum power ratio, wherein the method performs conditioning of the communications signal in a “first domain” and a “second domain”, “wherein the first domain is one of a quadrature domain and a polar domain, and the second domain is a different one of the quadrature domain and the polar domain.”

O’Loughlin is not directed at altering a communications signal to reduce and average-to-minimum power ratio. Further, as best understood, all of the processing (e.g. conditioning) is performed in a quadrature domain in O’Loughlin. It should be observed that, whereas O’Loughlin illustrates how signals can be represented equivalently in either quadrature or polar form, O’Loughlin does not teach conditioning in a polar domain as independent Claim 18 of the present invention recites. Accordingly, for at least this reason, O’Loughlin does not anticipate independent Claim 18.

For at least the foregoing reasons, Applicant respectfully believes that the § 102(b) rejection of independent Claim 18 cannot be properly maintained. Applicant requests, therefore, that the rejection be withdrawn.

35 U.S.C. § 103(a) Claim Rejection – Claim 15

In the Office Action, Claim 15 was rejected under 35 U.S.C. § 103(a) for allegedly being obvious over O'Dea et al. in view O'Loughlin. For the following reasons, Applicant respectfully disagrees.

Independent Claim 15 includes a step of “filtering a communications signal using a nonlinear filter in a polar domain”. Neither O'Dea et al. nor O'Loughlin, whether taken alone or in combination teach or suggest this step. Accordingly, for at least this reason, Applicant respectfully believes that the § 103(a) rejection of independent Claim 15 cannot be properly maintained, and requests, therefore, that it be withdrawn.

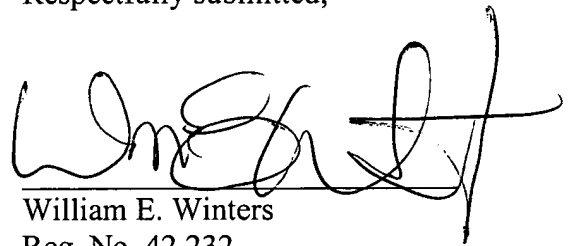
CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 408-282-1857.

Respectfully submitted,

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William E. Winters
Reg. No. 42,232

THELEN REID & PRIEST LLP
P.O. Box 640640
San Jose, CA 95164-0640
(408) 282-1857 Telephone
(408) 287-8040 Facsimile